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Ambient ionization mass spectrometry imaging of rohitukine, a chromone anti-cancer alkaloid, during seed and seedling development in *dysoxylum binectariferum* hook.f (meliaceae)

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Chromone alkaloids are a unique group of compounds containing a flavonoid or a noreugenin chromone component linked with a ring containing one or more nitrogen atoms. These are sparsely distributed in plants. Rohitukine, a prominent chromone alkaloid, has been reported from only four species, belonging to the families, Meliaceae and Rubiaceae. Among them the *Dysoxylum binectariferum* (Meliaceae) is reported to accumulate the highest amount of rohitukine. In recent years, chromone alkaloid, such as rohitukine has gained wide attention because of their pharmacological activities. In fact, flavopiridol, a derivative of rohitukine, has been approved as an anti-cancer drug. The biosynthesis of rohitukine is not yet elucidated. In this study, we examine the spatial and temporal distribution of chromone alkaloids during various stages of seed and seedling development in *D. binectariferum* using desorption electrospray ionization mass spectrometry imaging (DESI MSI). Rohitukine (m/z 306.2) accumulation increased from early seed development to seed maturity stage. The spatial distribution of rohitukine was largely restricted to the cotyledonary tissue followed by the embryo and least in the seed coat. In seedling, root and leaves contained the high amount of rohitukine compared to the stem and twigs. Besides rohitukine, rohitukine acetate (m/z 348.2) and glycosylated rohitukine (m/z 468.2) were also detected, both through mass fragmentation and exact mass analysis. All of these molecules showed the tissue specific distribution of metabolites in seed, stem, root and leaves. In summary, DESI MS results indicated that spatial and temporal pattern of distribution of metabolites. It would be interesting to examine the underlying genetic basis for such a pattern.

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Study of some epidemiological factors influencing the disease incidence in chickpea (*cicer arietinum* L)

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The investigations reported in this manuscript were carried on the screening of One hundred and seventy eight chickpea germplasm lines/cultivars against wilt disease, caused by *Fusarium oxysporum* f. sp. *ciceris*. The screening was conducted in vivo (field) conditions. The field screening was accompanied with the study of some epidemiological factors affecting the occurrence and severity of the disease. Among the epidemiological factors maximum temperature range (28-40°C), minimum temperature range (12-24°C), relative humidity (19-44%), soil temperature (26-41°C) and soil moisture range (19-34°C) was studied for affecting the disease incidence/severity. The results revealed that air temperature were positively correlated with diseases. Soil temperature data revealed that in all cultivars disease incidence were maximum as 39°C. Most of plants show 40-50% disease incidence. Disease incidence decreased at 33.5°C. The result of correlation of relative humidity of air and wilt incidence revealed that all cultivars/lines were negatively correlated with relative humidity. With increasing relative humidity wilt incidence decreased and vice versa.

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